

Claims

Sub. a1

1. An integral image recognition/display apparatus comprising:
a plurality of pixel portions each having an active device
and arranged in matrix and each having a pixel electrode
comprising a reflecting material and a light-transmitting
material over an active matrix substrate; and
a plurality of sensor portions arranged in matrix over
said active matrix substrate,
wherein said sensor portion includes a photo-electric
conversion device, and can read information by utilizing the
rays of light transmitting through said light-transmitting
material when an external image is read.

2. An apparatus according to claim 1, wherein said
active device comprises a bottom gate type TFT.

3. An apparatus according to claim 1, wherein said
active device comprises a top gate type TFT.

Sub. a2

4. An integral image recognition/display apparatus comprising:
a plurality of pixel portions each having an active device
and arranged in matrix and each having a pixel electrode
comprising a reflecting material and a light-transmitting
material over an active matrix substrate; and
a plurality of sensor portions disposed in matrix over

an opposed substrate constituting a display panel,

wherein said sensor portion has a photo-electric conversion device, and can read information by utilizing the rays of light transmitting through said light-transmitting material when an external image is read.

5. An apparatus according to claim 4, wherein color filters are disposed on said opposed substrate.

6. An apparatus according to claim 4, wherein said active device comprises a bottom gate type TFT.

7. An apparatus according to claim 4, wherein said active device comprises a top gate type TFT.

8. An integral image recognition/display apparatus comprising:

a plurality of pixel portions each having an active device and arranged in matrix and each having a pixel electrode comprising a reflecting material and a light-transmitting material over an active matrix substrate; and

a plurality of sensor portions arranged in matrix over said active matrix substrate, wherein said sensor portion has a photo-electric conversion device, and at least a part of said photo-electric conversion device is extended in such a manner as to overlap with said active device.

9. An apparatus according to claim 8, wherein said active device comprises a top gate type TFT.

Subst. 24
10. An integral image recognition/display apparatus comprising:

a plurality of pixel portions each having an active device and arranged in matrix over an active matrix substrate; and

a plurality of sensor portions arranged in matrix over said active matrix substrate,

wherein a pixel capacitance portion provided to each of said pixel portions functions also as a capacitance portion for image recognition, disposed in corresponding one of said sensor portions.

11. An apparatus according to claim 10, wherein a reflecting material and a light-transmitting material are used for a pixel electrode of each of said pixel portions.

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12. A semiconductor device comprising:

a pixel portion having an active device and a pixel electrode comprising a reflecting material and a light-transmitting material over an active matrix substrate; and

a sensor portion provided over said active matrix substrate and comprising a photo-electric conversion device,

wherein said active device and said pixel electrode and said photo-electric conversion device are provided in one of pixels arranged in matrix, and

wherein said sensor portion can read information by utilizing the rays of light transmitting through said light-transmitting material when an external image is read.

13. An apparatus according to claim 12, wherein said active device comprises a bottom gate type TFT.

14. An apparatus according to claim 12, wherein said active device comprises a top gate type TFT.

15. A semiconductor device comprising:

an active matrix substrate and an opposed substrate;

a pixel portion having an active device and a pixel electrode comprising a reflecting material and a light-transmitting material over said active matrix substrate; and

a sensor portion provided over said opposed substrate and comprising a photo-electric conversion device,

wherein said active device and said pixel electrode and said photo-electric conversion device are provided in one of pixels arranged in matrix,

wherein said active device and said pixel electrode and said photo-electric conversion device are provided in one of pixels arranged in matrix, and

wherein said sensor portion can read information by utilizing the rays of light transmitting through said light-transmitting material when an external image is read.

16. An apparatus according to claim 15, wherein color filters are disposed on said opposed substrate.

17. An apparatus according to claim 15, wherein said active device comprises a bottom gate type TFT.

18. An apparatus according to claim 15, wherein said active device comprises a top gate type TFT.

19. A semiconductor device comprising:

a pixel portion having an active device and a pixel electrode comprising a reflecting material and a light-transmitting material over an active matrix substrate; and

a sensor portion provided over said active matrix substrate and having a photo-electric conversion device,

wherein said active device and said pixel electrode and said photo-electric conversion device are provided in one of

pixels arranged in matrix, and

wherein at least a part of said photo-electric conversion device is extended in such a manner as to overlap with said active device.

20. An apparatus according to claim 18, wherein said active device comprises a top gate type TFT.

21.A semiconductor device comprising:

a pixel portion having an active device provided over an active matrix substrate; and

a sensor portion provided over said active matrix substrate,

wherein a pixel capacitance portion provided to said pixel portion functions also as a capacitance portion for image recognition, disposed in said sensor portion.

22.An apparatus according to claim 21, wherein a reflecting material and a light-transmitting material are used for a pixel electrode of said pixel portion.

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